

A NEW CLUB CHOLLA, *GRUSONIA ROBERTSII* (CACTACEAE)
FROM BAJA CALIFORNIA SUR, MEXICO

JON P. REBMAN

San Diego Natural History Museum, P.O. Box 121390, San Diego, CA 92112-1390
jrebman@sdnhm.org

ABSTRACT

A new species of club cholla (*Grusonia robertsii*) endemic to the Vizcaíno Desert of Baja California Sur is described here for the first time. Distribution, associated vegetation, rarity, affinities to other related species, a botanical illustration, a key to the species in the genus *Grusonia* of the Lower California region, and a key for the generic reclassification of *Opuntia* sensu lato as recognized by Wiggins (1980) but currently treated as three different genera in the region are also presented.

RESUMEN

Se describe aquí por primera vez una especie nueva de casa rata (*Grusonia robertsii*) endémica del Desierto Vizcaíno, del estado de Baja California Sur. Se presentan la distribución, vegetación asociada, rareza, afinidad con otras especies en el género, una ilustración del nuevo taxón, una clave a las especies en el género *Grusonia* de la península de Baja California, y una clave para la reclasificación genérica de *Opuntia sensu lato* de Wiggins (1980), que actualmente es tratada como tres géneros diferentes en esta región, y que también se presentan aquí.

Key Words: Cactaceae, *Grusonia*, *Corynopuntia*, Baja California Sur, Mexico.

Lower California is comprised of two Mexican states (Baja California and Baja California Sur) that are politically divided at the 28th parallel. These states comprise the Baja California peninsula and its adjacent islands located in both the Gulf of California (Sea of Cortés) and the Pacific Ocean. This region supports a wealth of plant species diversity. Wiggins (1980) estimated that 2958 total taxa including 686 endemic taxa occur in Lower California or an endemism rate of 23.2%, but recent plant discoveries and a more complete overview of the literature suggests that the flora consists of more than 4000 plant taxa with a rate of endemism closer to 30% (Rebman 2001). The Cactaceae are a conspicuous and diverse component in most areas and plant communities of Lower California. According to Rebman (2001), the Cactaceae of Lower California are represented by 15 genera, 104 species, and 129 total taxa. Of these, 71 species and 92 taxa are endemic to the region, a 68.3% endemism rate for species and 71.3% for taxa. The genus *Opuntia* Miller sensu lato (including *Grusonia* Britton & Rose [*Corynopuntia* F. M. Knuth to some authors], *Cylindropuntia* (Engelm.) F. M. Knuth, and *Opuntia* sensu stricto) was considered to have the highest number of overall taxa (41) in the region before it was split into three genera (Anderson 2001). Only two species in the genus *Grusonia* (*G. invicta* (Brandege) E. F. Anderson and *G. kunzei* (Rose) Pinkava) were previously known to occur on the peninsula of Baja California.

Grusonia robertsii Rebman, sp. nov. (Fig. 1)

Type. MEXICO, Baja California Sur: Vizcaíno Desert near 27°19'N, 113°08'W, between San Ignacio and Guerrero Negro, 28 October 2001, Rebman 7795 (holotype: SD 148287; isotypes: ASU, BCMEX, HCIB).

Paratypes. MEXICO, Baja California Sur: Vizcaíno Desert, between San Ignacio and Guerrero Negro, 10 May 1992, Rebman 1361 (ASU 187542, SD 155542); 10 March 1998, Rebman 4836 & N. Roberts (SD 143343).

Note. The specific locations of this new cactus species including detailed latitude and longitude coordinates have been intentionally omitted due to the lack of known populations, its rarity in the field, and the popularity that cacti have in the hobby/horticultural industry.

Latin diagnosis. *Grusonia kunzei* (Rose) Pinkava simile, sed differt fructibus brevioribus 20–35 mm longis, areolis per fructum paucioribus (25–30), et spinis majoris caulinis complanatis leviter basi.

English diagnosis. This species resembles *Grusonia kunzei* but differs in having a shorter fruit, 20–35 mm in length, fewer areoles (25–30) per fruit, and major spines of the stems only slightly flattened at the base.

Shrubs, low to nearly mat-forming, to 45 cm tall. **Stem** segments succulent, 7.5–11 × 2.5–3.5 cm (Fig. 1A); tubercles prominent, 20–35 ×

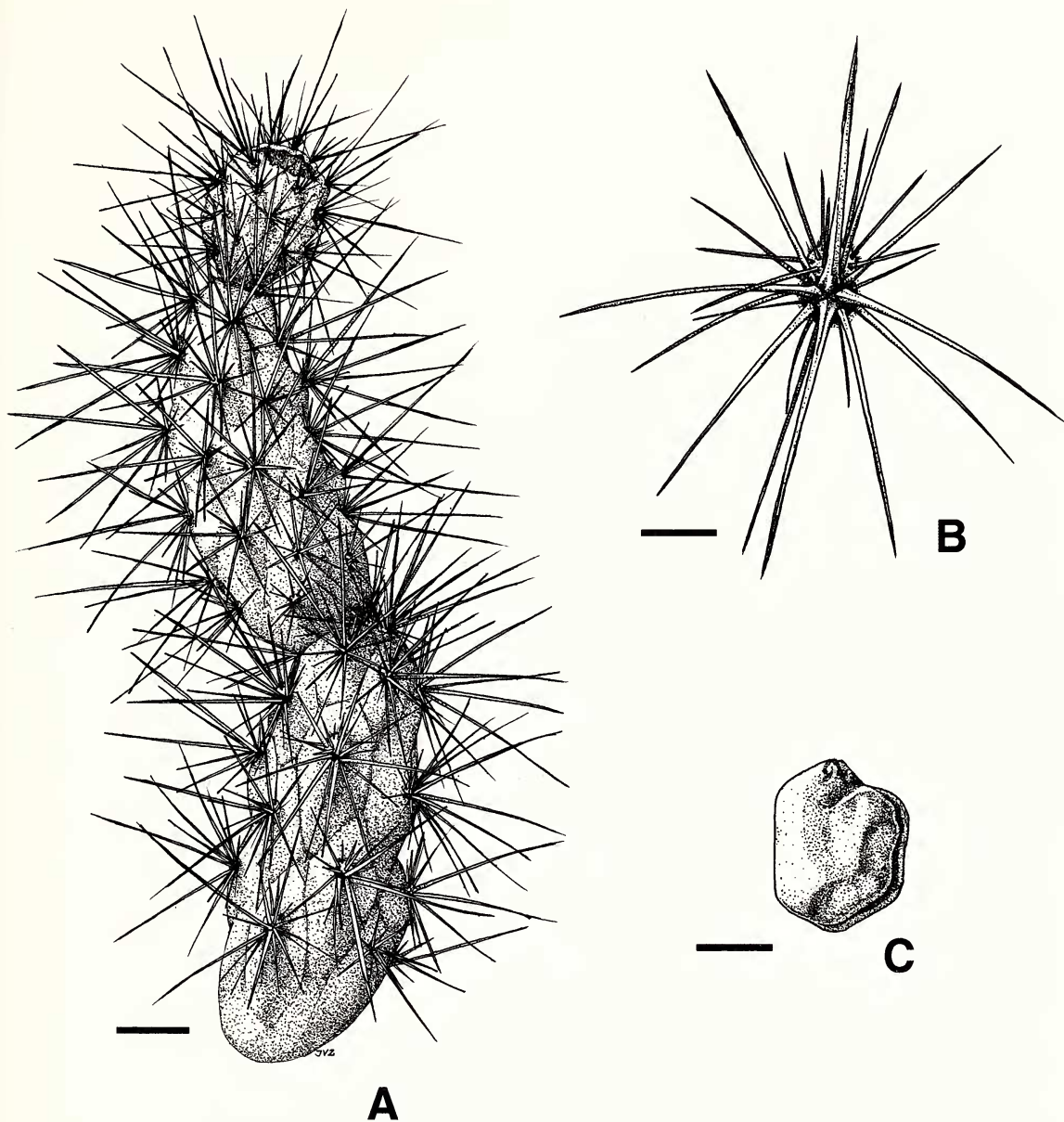


FIG. 1. *Grusonia robertsii*, showing terminal stem segments and immature fruit with long, deciduous glochids (A), measurement bar = 2 cm; stem areole with spines (B), bar = 1 cm; seed (C), bar = 2 mm.

5–13 mm. **Areoles** 6–7 × 4–6 mm with cream to gray wool. **Spines** 12–20 per areole (Fig. 1B), lavender-gray (yellowish on one individual), uniformly distributed along the stem, the central, major ones 3–4, divergent, slightly flattened to strongly angled at base, 0–4 sheathless, bristle-like spines. **Glochids** in a sparse, apical crescent on stem areoles, gray to dark brown, 2–9 mm; fruit and flower areoles with an apical crescent of cream to light yellow glochids, 2–6 mm; plus in flower areoles other glochids are present, orange-brown to gray, up to 25 mm long. **Flowers** yellow; filaments green; styles greenish-yellow.

Fruits sub-spheric to short turbinate, 20–35 × 15–22 mm with 25–30 areoles; covered with long, deciduous glochids when young but at maturity, mostly spineless with up to 7 spines strongly attached in some scattered areoles; yellow and fleshy when ripe. **Seeds** 25–35 per fruit, 3–4.5 mm in diameter (Fig. 1C).

Distribution and Habitat. Endemic to Baja California Sur; individuals of *Grusonia robertsii* occur on flat plains and lower slopes of volcanic mountains in coarse sandy substrates scattered with large basaltic rocks; elevation 120–240 m;

Vizcaíno Desert associated with a succulent desert scrub dominated by *Yucca valida* Brandege, *Pachycereus pringlei* (S. Watson) Britton & Rose, *Fouquieria diguetii* (Tiegh.) I. M. Johnston, *Bursera microphylla* A. Gray, *Stenocereus gummosus* (Engelm.) Gibson & Horak, *Grusonia invicta*, *Cylindropuntia cholla* (F. A. C. Weber) F. M. Knuth, and *Echinocereus brandegeei* (Coulter) K. Schum. Additional associates include: *Atriplex barclayana* (Benth.) D. Dietr., *Cylindropuntia alcahes* (F. A. C. Weber) F. M. Knuth, *Euphorbia misera* Benth., *Ferocactus peninsulae* Britton & Rose, *Frankenia palmeri* S. Watson, *Lophocereus schottii* (Engelm.) Britton & Rose var. *schottii*, *Mammillaria dioica* K. Brandege, *M. lewisiana* Gates, *Pedilanthus macrocarpus* Benth., *Stenocereus thurberi* (Engelm.) Buxbaum, and *Tillandsia recurvata* L.

Phenology. Flowers in May; fruits persist on plant until at least November.

Etymology. This new cactus is being named in honor of Dr. Norman Roberts, a friend, naturalist, and explorer of the deserts in Lower California. Dr. Roberts has contributed immensely to our knowledge and enjoyment of plants in Lower California by publishing a book entitled "Baja California Plant Field Guide" (Roberts 1989), and by promoting and facilitating botanical studies and explorations in the region.

DISCUSSION

Grusonia robertsii, found in the Vizcaíno Desert of northern Baja California Sur, is a rare, but distinct new club cholla. Although it grows sympatrically with *G. invicta*, it appears to be most closely related to *G. kunzei*, which is found in southwestern Arizona, Sonora and approximately 450 km to the north in the San Felipe Desert of Baja California.

In 1992, when I discovered the first individual of *Grusonia robertsii*, I originally thought it to be a naturally occurring, intergeneric hybrid between *Grusonia invicta* and *Cylindropuntia alcahes*. Interspecific hybridization is a common occurrence in the Cactaceae, especially in the genus *Cylindropuntia*, and has played an integral part in the evolutionary process of the family (Pinkava et al. 1998). However, after closer morphological evaluation and after the discovery of other individuals in the population at the type locality over the years, I have determined it to be a new, rare species in the genus *Grusonia*. Although only six individuals of this new species have yet been recorded, it does not seem to be of hybrid origin. This new taxon has spine sheaths deciduous only at the spine apex, major spines that are flattened to angled at the base, areoles of flowers and fruits with longer tufts of wool, and

a low-growing habit; all are characteristics of the genus *Grusonia*. However, the shape of the fertile fruits is not like other known species in the genus, which is usually narrowly obconic to ellipsoid. In fact, the fruit of this new species is more similar to that found in various species of the genus *Cylindropuntia* which are short-turbinate to subspherical. It should be noted that there are no known hybrids between the opuntoid genera *Cylindropuntia* and *Grusonia*, and that the high seed set in the fruits of this new taxon would seem to indicate that it is reproducing by seeds.

Part of the reason for its paucity of field observations and collections is due to the difficulty in differentiating this new species from other sympatric cacti at a distance. It is convergent in growth habit to *Grusonia invicta* and to *Echinocereus brandegeei*, both of which are common species in the vegetation of the type locality. All three species are low-growing to mat-forming shrubs that are densely shrouded with gray spines and without close inspection, the vegetative parts of these species are readily confused. Although *E. brandegeei* has bright yellow, acicular spines in much of its distribution, it has gray, flattened spines in the region of the peninsula near San Ignacio. In truth, I have visited the type locality for *G. robertsii* at least six different times and almost each visit has revealed a new individual in the population (the last time with five separate individuals observed was in October 2001). Because the vegetation and habitat in which this new species occurs is quite widespread in this part of the peninsula, it is probable that this new club cholla is more common than is currently known. As a matter of fact, during a trip to the region in January 2005, I observed another individual plant (a yellow-spined form) of this new species almost 30 km southeast of the type locality. Conversely, there are other cacti on the peninsula such as *Echinocereus lindsayi* J. Meyran that also occur in a widespread habitat and vegetation type of the Vizcaíno Desert that are very rare indeed, which might also be the case for this new species.

KEY TO THE SPECIES IN THE GENUS *GRUSONIA* IN LOWER CALIFORNIA

1. Stems subspherical, length < 2 times width; flowers with reddish filaments
 *G. invicta* (Brandegee) E. F. Anderson.
- 1'. Stems cylindrical-clavate, length > 2 times width; flowers with yellow to green filaments.
2. Fruit very spiny, narrowly ellipsoid to cylindrical, 40–75 mm in length, with 40–70 areoles, major spines of stem areoles strongly flattened; occurs in Arizona, Sonora and northern Baja California *G. kunzei* (Rose) Pinkava.
- 2'. Fruit naked to sparsely spiny, short turbinate to subspherical, 20–35 mm in length, with 25–30 areoles; major spines of stem areoles mostly angled to slightly flattened at base; known

only from northern Baja California Sur
 *G. robertsii* J. Rebman.

Separation of the Genus *Opuntia Sensu Lato*

The large genus *Opuntia sensu lato* is currently being recognized (Anderson 2001) as various smaller, segregate genera. In Lower California, the genus *Opuntia* s.l. as recognized by Wiggins (1980) is now treated as three different genera: *Grusonia* (or *Corynopuntia* for some authors), *Cylindropuntia*, and *Opuntia* s.s. These three genera can easily be distinguished based upon vegetative morphology such as stem shape and spine characters.

KEY TO THE GENERA OF LOWER CALIFORNIA
 PREVIOUSLY RECOGNIZED AS *OPUNTIA*
SENSU LATO

- 1. Stem segments cylindric to clavate; spines variously sheathed (at least when young).
- 2. Stem segments cylindric; trees or shrubs, erect to decumbent or trailing but not mat-forming; spine sheaths covering entire spine and sometimes long-persisting; spines round in cross-section
 *Cylindropuntia* (chollas).
- 2'. Stem segments clavate to spheric; shrubs, low, mat-forming or caespitose; spine sheaths only covering spine tips and usually quickly deciduous; most major spines flattened in cross-section
 *Grusonia* (club chollas).
- 1'. Stem segments flattened into cladodes or rarely subcylindric; spines sheathless.
 *Opuntia* (prickly-pears, nopales).

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